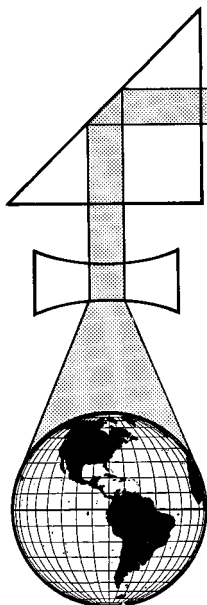


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NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER R & D NEWS NOTES

TECHNICAL SERVICES and SUPPORT GROUP

Vol. 1, No. 6

July, 1968

The following items have been taken from R&D progress reports of the Technical Services and Support Group and are being distributed because of their general interest. We would like to know what questions or problems you have concerning the items reported in this edition. Your comments concerning related R&D topics will also be appreciated. A form is attached that will make it more convenient for you to submit your comments. An effort will be made to answer them either personally or in future R&D News Notes.

Zoom 70 Acuity Adapters Ready for PI's

The [] Acuity Adapters, designed to correct a PI's astigmatism and visual acuity error, are now available for order from the contractor. The adapters along with their own special light shielding eyecups fit directly over the Zoom 70 10X eyepieces and enable a PI to continuously view imagery without his glasses. A set of the adapters may be seen in use by those interested in Room 3S-464B at the PI station of []. Further information about ordering the adapters may be obtained from Group or Staff equipment and supply officers. Additional technical details may be obtained from [] association with [] CIA is classified Confidential, but all other aspects of this project are [].

Declass Review by NGA.

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Ultra-Violet Rear Projection Viewer

Imagery display and viewing procedures may be revolutionized by a development project recently contracted with [REDACTED]. Based on new findings in studies with ultra-violet light, this project should overcome the main current objections to rear-projection viewers. Rear-projection viewers offer many advantages for the rapid interpretation of reconnaissance imagery in that they provide more convenient viewing, making it possible for several persons to study the same piece of imagery at the same time and, most important, when compared with conventional microscopes, rear projection screens produce a 14 to 1 increase in the area viewed at any given magnification. However, the potential of these devices has been greatly reduced because so much information is lost when the image is relayed through the screen of conventional viewers. Preliminary tests of the specially developed components indicate that a transparent screen coated with a transparent phosphor and illuminated by ultra-violet light will provide a technological breakthrough to overcome the operational and performance objections to conventional rear-projection viewers.

[REDACTED] began work in June 1968 on the Ultra-violet Rear Projection Viewer. This contract calls for delivery to the NPIC in about 1 year of a breadboard version of the viewer. At that time the performance will be demonstrated to all interested parties and the operational requirements will be set. An operational model will be ready for delivery to photo interpreters in 3½ to 4 years. By that time the increased volume and quality of photo missions will demand a rear projection viewer that will meet the most demanding criteria of performance and ease of operation. The Project Officer is [REDACTED] Room 5S-453H). This work is classified [REDACTED]

New Heat Processed Diazo

Another unique development from the [REDACTED] laboratories is a high quality diazo film that requires no ammonia or other chemicals for development. The film which can be used in room light is exposed using ultra-violet light and then processed by simply heating to a temperature of approximately 260°F. Since no ammonia vapors are required or are given off during development, the processing can take place in a relatively closed area. Most normal venting will carry off excess heat. As with regular diazo, the gamma is "built-in". However, slight variations can be produced by varying exposure and processing time.

The general characteristics are as follows:

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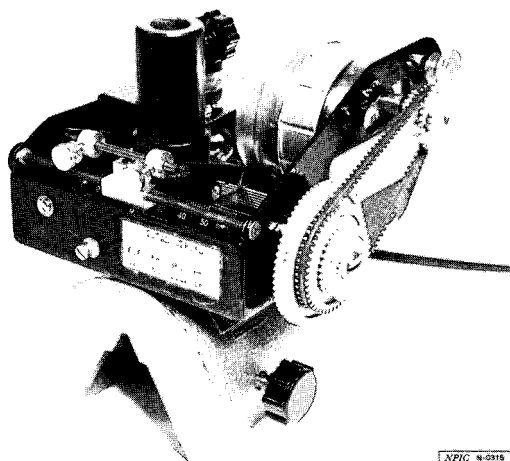
Resolution	500 1/mm
Gamma	1.20 - 1.50
D max	1.5 - 2.0
D min	0.06 - 0.10
Color	near neutral
Development Temp	250° - 290°F
Base	Film and Paper



[redacted] Room 5S-453H) is the Project Officer.

Low-Cost Control

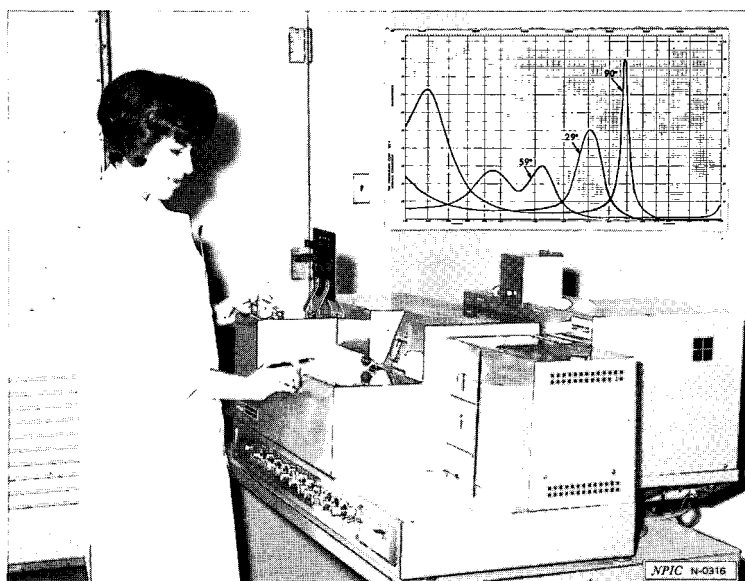
A novel and very inexpensive electro-mechanical control device has been produced in the Exploratory Laboratory of the NPIC Technical Services & Support Group. Although this particular control was built to serve a specific and limited purpose, the principle is applicable to other uses and the device itself is a testimonial to the Laboratory's versatility and ingenuity. The photo shows how an optical bench cross-carriage has been motorized so it can travel to the left adjustable limit position and stop; or to the right adjustable limit position and stop; or scan continuously between these two limits. Its unique feature is the simplicity of control circuitry which accomplishes these three modes of operation. The control elements are a two-pole rotary mode selector switch, a motor reversing limit switch, a spring loaded friction block and adjustable end-position thumbscrew collars. The friction block is the key element. It is the white rod-mounted block just below, and actuated by, the thumbscrew collars. This block performs a memory function by holding the limit switch, located beneath it, in its last actuated position until the carriage traverses its entire stroke. Then a thumbscrew collar nudges the block just far enough to trip the limit switch which reverses the motor. [redacted] Room 4N-411) designed and built the scanner and can furnish additional details. [redacted]



NPIC 8-0318

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Instrument Performs Double Duty

The Exploratory Laboratory currently realizes a dividend from its [redacted] Model 450 Spectrophotometer. Originally acquired as a precise instrument for chemical analysis, the 450 is also used to determine the characteristics of optical system components.

This instrument measures the amount of incoming ultraviolet, visible or infrared energy that is transmitted or reflected by a test specimen. Thus, in determining the characteristics of optical components, the transmission or reflection of that component is measured and compared with that of a standard in the energy range of interest. The component is said to transmit or reflect a fraction of the incoming energy, compared to the transmission or reflection of the standard which represents the 100% level.

The insert graph in the photo is typical of the instrument data presentation. This series of transmission curves pertains to a dichroic filter, which changes transmission characteristics depending upon the incident angle which the incoming energy makes with the filter. The angles are indicated on the curves. The horizontal scale shows decreasing energy from left to right (violet to red) while the vertical scale shows an increasing fraction of transmission, bottom to top, referenced to the transmission of air as 100%.

The instrument is capable of producing myriad data of value to optical designers. Examples include: Transmission characteristics of filters, coated lenses and mirrors; effective energy partition in the respective paths of a beam splitter; tristimulus (the amounts of the three primary colors present) values of colored reflective surfaces; etc.

The 450 currently has time available for examining optical components. The instrument scientist is [redacted]

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R&D NEWS NOTES

(Date)

TO: Editor, R&D NEWS NOTES, TSSG/DED

FROM:

I would like to offer my comments/questions concerning some of the following items.

- a. Zoom 70 Acuity Adapters Ready for PI's
- b. Ultra-Violet Rear Projection Viewer
- c. New Heat Processed Diazo
- d. Low-Cost Control
- e. Instrument Performs Double Duty